

OBSERVATIONS ON THE MORPHOPRODUCTIVE CHARACTERISTICS OF A NUCLEUS OF CATTLE, GREY STEPPE BREED

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Abstract

Research was conducted on a nucleus of 38 Grey steppe breed individuals from SCDCB Dancu, Iasi. Main pursue issues were to measure the main indices of the female body development from birth to the third calving and the qualitative and quantity character values of milk production for the first three lactations. Data were extracted from primary records of the farm and were processed statistically. Body development recorded mean values, for the main morphological indicators are within the breed limits for the Moldavian variety. Grey steppe, on normal lactation, recorded the following means values: 1st lactation -1519.55 kg milk, 2nd lactation -1640.90 kg milk, 3rd lactation -1774.78 kg milk. Average milk quality parameters were for the 1st lactation: 4.48 % fat, 3.52% protein; 2nd lactation: 4.54 % fat, 3.60 % protein; 3rd lactation: 4.72 % fat, 3.67 % protein.

Key words: Grey steppe, morph productive characteristics, lactation

INTRODUCTION

In Romania, Grey steppe breed may be placed in the genus *Bos*, subgenre *Taurus primigenius* species, subspecies Cattle without hump, being widespread in our country since ancient times [1] [3].

In the 1935 Grey steppe breed had a share of about 57.30% of the total cattle herd, and only 0.6% in 1977.

Currently the Grey steppe breed is found sporadically in the north-east and south of Moldova in areas like Neamt, Bacau, Vrancea, Vaslui, Iasi and Galati and the Danube Delta, more as half caste. Pure breed can be found at Cattle Research and Development Station Dancu - Iasi, Neamt Piatra TCE 3 Brazi, Research and Development for Meadows Station Jucu - Cluj. Isolated specimens or undefined half caste can be found in households in this area [2]. Body measurements data presented in literature in the period 1947-1963, show values of waist from 132.81 to 128.00 cm, chest perimeter: from 179.36 to 174.3 cm and a weight with values between 372 and 394 kg [2].

Grey steppe breed research of the 80s years, shows a weight at calving of 29 kg for

females and 27 kg for males. Female reach half of their adult weight in less than 12 months (244 kg), and calves at the age of 16 to 18 months (387 kg). In the first 5 years of the female life, their weight increases up to 17 times, and 25 times for males. [3].

In 2009 data showed mean values of 122.28 cm for cattle's waist and 542.86 kg for body weight, values which show a massive body and a waist decrease [2].

Data from 2009 research shoes that, total lactation and normal lactation have the same duration not exceeded 305 days (254.80-290.50 days). The milk production per lactation was between 1589.64 kg (first lactation) and 2535.43 kg (fifth lactation - representing the maximum lactation) [2].

Due to the small number of animals of this breed of cattle and the few literature data concerning their morph-productive characteristics, this paper aims to make a contribution the breed existing data, by current observations.

MATERIAL AND METHODS

The biological material studied was the formed by 38 Grey steppe breed cattle, from SCDCB Dancu, Iași. To this core were development female body indicators were

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followed from calving to their third calving, milk production for the first three lactations, and the main indicators for the three reproductive cycles of calving.

The resulting data from were observations and direct measurements on the farm, and from the OARZ (Office for Breeding and Reproduction in Husbandry) database records. Resulting data were statistical processed by a program developed within the Cattle technology discipline (SAVC Statistics analysis of variance and covariance).

RESULTS AND DISCUSSIONS

Following studies on body development in young female Grey steppe breed, using 38 individuals, were found following average

values for the main body measurements:

- withers height at birth was 71.7 ± 0.51 cm, 96.9 ± 1.69 cm at 6 months, 109 ± 0.83 cm at 12 months and 116 ± 0.53 cm at 18 months.

- thoracic perimeter at birth was 77.36 ± 0.23 cm, 135.8 ± 2.91 cm at 6 months, 146 ± 1.81 cm at 12 months and 164.9 ± 1.20 cm at 18 months .

- horizontal length at birth was 68.81 ± 0.18 cm, at 6 months was 109.3 ± 1.58 cm, 123.4 ± 1.14 cm at 12 months and 132.55 ± 1.17 cm at 18 months.

- body weight at birth was 29.38 ± 0.18 kg, at 6 months was 221.1 ± 8.35 kg, at 12 months was 277.9 ± 7.56 kg and 360.15 ± 6.04 kg to 18 months (table 1).

Table 1 The average values and variability of body development in young cattle Grey Steppe breed

Specification	Height at withers	Thorax width	Thorax depth	Thorax perimeter	Sloping body length	Rump width at hips	Rump width at thighbone joint	Rump width	Shinbone perimeter	Body weight	
U.M.	cm	cm	cm	cm	cm	cm	cm	cm	cm	Kg	
At birth	n	38	38	38	38	38	38	38	38	38	
	\bar{X}	71.7	17.15	33.55	77.36	68.81	18.18	19.84	22.98	8.15	29.38
	$\pm s_{\bar{x}}$	0.51	0.16	0.24	0.23	0.18	0.15	0.13	0.22	0.05	0.18
	s	3.19	1.0	1.53	1.44	1.15	0.94	0.84	1.36	0.36	1.11
	V%	4.44	5.98	4.58	1.86	1.68	5.21	4.26	5.92	4.52	3.78
	Min	66	15	30	74	66	16	18	18	7.5	28
Max	79	19	36	80	71	20	21	25	9	31	
6 months	n	38	38	38	38	38	38	38	38	38	
	\bar{X}	96.9	25.09	40.64	135.8	109.3	24.57	26.02	30.15	10.81	221.1
	$\pm s_{\bar{x}}$	1.69	0.60	0.42	2.91	1.58	0.91	0.54	0.61	0.42	8.35
	s	10.4	3.74	2.64	17.97	9.77	5.62	3.36	3.81	2.63	51.52
	V%	10.7	14.93	6.51	13.23	8.93	22.89	12.92	12.65	24.4	23.3
	Min	82	18	34	91	89	17	22	24	7	71
Max	119	38	47	150	120	41	38	43	16	285	
12 months	n	38	38	38	38	38	38	38	38	38	
	\bar{X}	109	30.9	49.5	146	123.4	34.26	32.57	38.57	14.39	277.9
	$\pm s_{\bar{x}}$	0.83	0.74	0.66	1.81	1.14	0.64	0.47	0.49	0.35	7.56
	s	5.14	4.57	4.10	11.21	7.02	3.95	2.93	3.06	2.19	46.64
	V%	4.72	14.77	8.29	7.68	5.69	11.52	9.01	7.94	15.28	16.78
	Min	98	23	41	131	103	28	26	32	10	189
Max	117	41	59	162	132	45	41	47	17	350	
18 months	n	38	38	38	38	38	38	38	38	38	
	\bar{X}	116	36.0	57.07	164.9	132.55	41.78	41.73	46.05	15.28	360.15
	$\pm s_{\bar{x}}$	0.53	0.68	0.66	1.20	1.17	0.65	0.76	0.51	0.27	6.04
	s	3.30	4.21	4.08	7.44	7.23	4.04	4.71	3.18	1.72	37.24
	V%	2.84	11.69	7.15	4.51	5.45	9.68	11.28	6.92	11.26	10.34
	Min	108	27	45	140	114	33	33	40	12	270
Max	120	47	66	178	143	49	50	50	19	433	

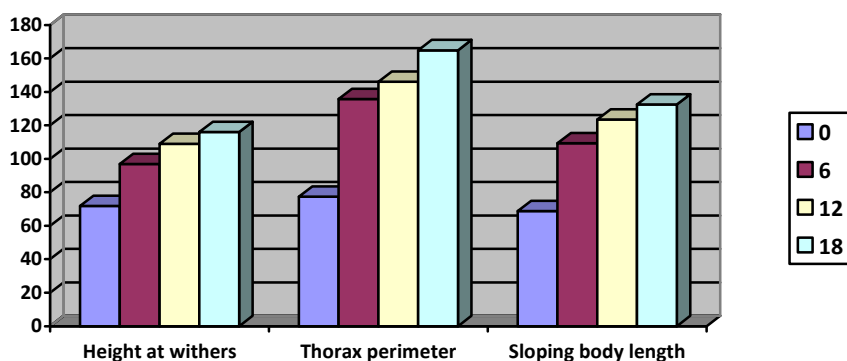


Fig. 1 Body development in young cattle Grey Steppe breed

Body measurements in Grey steppe cattle in the first three lactations showed average values following:

- withers height on first lactation was 122.7 ± 1.078 cm, on 2nd lactation was 124.8 ± 0.74 cm and on 3rd lactation was 126.5 ± 0.54 cm

- thoracic perimeter on first lactation was 181.7 ± 1.48 cm, 2nd lactation was 182.5 ± 2.96 cm and on 3rd lactation was 194.3 ± 1.71 cm

- horizontal length on first lactation was 149.8 ± 1.219 cm, on 2nd lactation was 153.4 ± 1.77 cm and on 3rd lactation was 154.1 ± 2.19 cm

- Body weight on first lactation was 500.3 ± 9.34 kg, on 2nd lactation was 514.2 ± 11.45 kg and on 3rd lactation was 593.1 ± 15.51 kg (Table 2).

Table 2 The means values and variability of body development cattle Grey Steppe breed for first three lactations

Specification		Height at withers	Thorax width	Thorax depth	Thorax perimeter	Sloping body length	Rump width at hips	Rump width at thighbone joint	Rump width	Shinbone perimeter	Body weight
A ¹	F	5.449	0.188	3.397	7.529	1.197	0.195	1.446	2.608	9.954	14.46
	p	0.006	0.829	0.038	0.001	0.307	0.823	0.241	0.080	0.000	0.000
I lactation	n	38	38	38	38	38	38	38	38	38	38
	\bar{X}	122.7	43.65	63.60	181.7	149.8	45.07	43.05	49.60	17.21	500.3
	$\pm s \bar{x}$	0.78	0.59	0.64	1.48	2.19	0.45	0.47	0.38	0.17	9.34
	s	4.81	3.68	3.96	9.14	13.55	2.80	2.91	2.36	1.09	57.61
	V%	3.92	8.44	6.24	5.03	9.04	6.21	6.76	4.76	6.35	11.51
	Min	117	36	52	154	124	39	39	43	15	405
	Max	130	51	69	204	171	51	49	53	19	690
II lactation	n	29	29	29	29	29	29	29	29	29	29
	\bar{X}	124.8	44	65.58	182.5	153.4	48.27	44.48	51.51	18.24	514.2
	$\pm s \bar{x}$	0.74	0.93	0.82	2.96	1.77	0.93	0.79	0.81	0.16	11.45
	s	3.99	5.04	4.46	15.95	9.56	5.01	4.26	4.41	0.87	61.68
	V%	3.19	11.47	6.8	8.74	6.23	10.38	9.58	8.56	4.78	11.99
	Min	118	35	54	123	134	38	36	42	17	415
	Max	134	52	72	208	172	56	50	58	20	655
III lactation	n	17	17	17	17	17	17	17	17	17	17
	\bar{X}	126.5	43.23	66.35	194.3	154.1	47.23	43.41	50.58	18.17	593.1
	$\pm s \bar{x}$	0.54	0.80	0.88	1.71	2.19	0.77	0.73	0.82	0.27	15.51
	s	2.23	3.32	3.63	7.05	9.05	3.21	3.02	3.41	1.13	63.98
	V%	1.76	7.69	5.48	3.62	5.87	6.79	6.96	6.74	6.22	10.78
	Min	124	38	55	183	134	41	38	44	15	496
	Max	131	48	72	208	172	52	49	55	20	731

Note: ¹ Anova

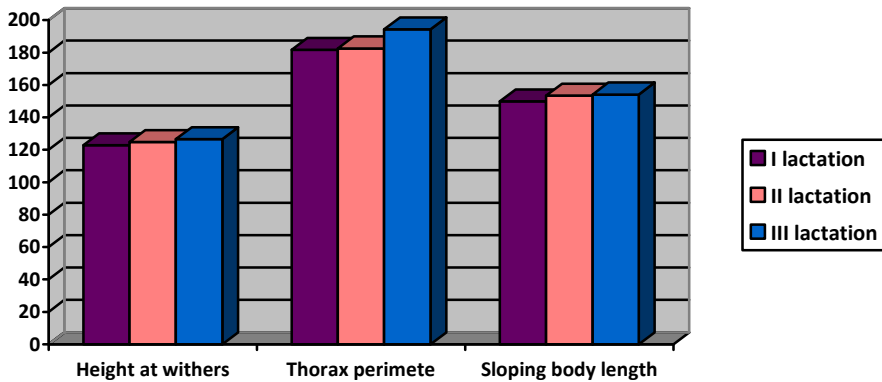


Fig. 2 Body development in cattle Grey Steppe breed for first three lactations

The average duration of lactation was generally short normal, with values between days 253.44 ± 8.57 days lactation him and 255.65 ± 9.24 days in 2nd lactation and 3rd for lactation is $249, 85 \pm 14.91$ days. Variability of these qualities was particularly pronounced (17.5%, 16.17% and 22.33%).

Normal lactation milk production was quite low, with mean values between 1519.5 ± 93.8 kg in lactation I, 1640.9 ± 115.05 kg in lactation II, 1774.7 ± 174.48 kg in the third lactation.

In the first three lactation milk production describes a curve upward increase in milk production II being 14.37% and in the third lactation by 21.90% compared with 1st lactation.

Fat content of milk is superior to other domestic breeds, with mean values of $4.48 \pm 0.08\%$ in lactation I, $4.54 \pm 0.07\%$ in the second lactation and $4.72 \pm 0.10\%$ in the third lactation.

Appropriate amount of milk and fat content, the average amount of fat was 68 ± 4.26 kg between to first lactation, 73.7 ± 4.74 kg in lactation II and 83.7 ± 8.60 kg in the third lactation (Table 3).

Mean age at first calving was 1006.31 days with a range of 618 and 1736 days with a pronounced variability (28.42%) which shows poor reproductive precocity at Grey Steppe breed.

For gestation was recorded 275.71 days for first calving (V-3,04 %), 278.95 days for 2nd calving (V-3,72 %) and 276.43 days for the 3rd calving (V-4,37 %).

Service period and calving interval between recorded values well above the normal mean (Table 4) which shows that the position of breeding did not take place in the conditions of exploitation of animals for certain production.

CONCLUSIONS

1. Development body for the major mean recorded morphological indicators falling within the breed for Moldovan variety.

2. The mean duration of lactation was generally short normal, with values between 253.44 ± 8.57 days for first lactation and 255.65 ± 9.24 days in lactation II and $249,85 \pm 14.91$ days for 3rd lactation.

3. In the first three lactation, milk production describes an ascending line; 2nd milk lactation was with 14.37%, 3rd lactation was with 21.90% more compared with first lactation.

4. Average age at first calving was 1006.31 days, with a range of 618 and 1736 days, with a pronounced variability (28.42%).

5. Service period and calving interval recorded average values far above to the normal values.

Table 3 The means values and the statistical data of milk production variability on successive lactations to the Grey Steppe Bred from SCDCB Danacu

Specification		Normal lactation						Total lactations					
		Lactation length day	Milk kilo	fat		protein		Lactation length day	Milk kilo	fat		protein	
A ¹	F	0.065	1.067	1.74	1.88	2.02	2.20	0.595	1.395	0.80	1.209	0.16	0.762
	p	0.937	0.351	0.18	0.61	0.14	0.11	0.581	0.318	0.49	0.362	0.85	0.507
	UM	days	kg	%	kg	%	kg	days	kg	%	kg	%	kg
I lactation	n	27	27	27	27	27	27	5	5	5	5	5	5
	\bar{X}	253.44	1519.5	4.48	68	3.52	53.7	391.4	2590.4	4.32	111.6	3.47	90.8
	$\pm s_x$	8.57	93.8	0.08	4.26	0.03	3.30	42.5	263.53	0.09	111.6	0.12	11.58
	s	44.5	487.56	0.43	22.1	0.20	17.1	95.1	589.28	0.22	23.8	0.28	25.9
	V%	17.5	32.0	9.78	32.5	5.85	31.9	24.3	22.7	5.11	21.3	8.30	28.53
	Min	144	677	3.72	25.3	3.15	22.4	306	1993	4.1	84	3.22	64.17
	Max	305	2296	5.32	107	3.91	81.1	530	3565	4.67	150	3.89	130.4
II lactation	n	20	20	20	20	20	20	2	2	2	2	2	2
	\bar{X}	255.65	1640.9	4.54	73.7	3.60	59.1	344.5	1882	4.46	84.31	3.53	66.51
	$\pm s_x$	9.24	115.05	0.07	4.74	0.04	4.20	16.5	270	0.09	13.8	0.03	10.09
	s	41.35	514.53	0.33	21.2	0.21	18.7	23.33	381.83	0.12	19.52	0.04	14.27
	V%	16.17	31.35	7.34	28.7	5.97	31.7	6.77	20.28	2.85	23.15	1.2	21.46
	Min	133	478	3.97	23	3.2	17	328	1612	4.37	70.51	3.5	56.42
	Max	305	2803	5.18	111	4.09	99	361	2152	4.55	98.12	3.56	76.61
III lactation	n	14	14	14	14	14	14	2	2	2	2	2	2
	\bar{X}	249.85	1774.7	4.72	83.7	3.67	64.4	325.5	2286	4.22	97	3.63	83.44
	$\pm s_x$	14.91	174.48	0.10	8.60	0.08	6.32	19.5	144	0.07	8	0.42	14.69
	s	55.79	652.86	0.40	32.1	0.31	23.6	27.57	203.64	0.10	11.31	0.59	20.78
	V%	22.33	36.78	8.48	38.4	8.51	36.7	8.47	8.9	2.51	11.66	16.3	24.9
	Min	116	434	4	22	3.09	19	306	2142	4.15	89	3.21	68.75
	Max	305	2815	5.42	139	4.27	104	345	2430	4.3	105	4.05	98.14

Note: ¹ Anova

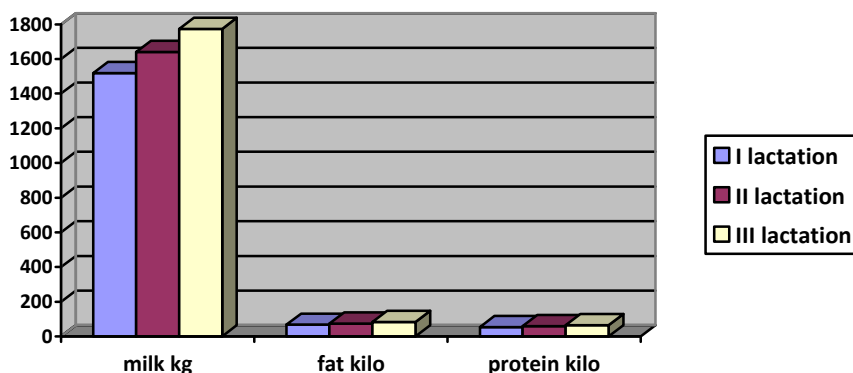


Fig.3 Productive parameters in cattle Grey Steppe breed for first three lactations

Table 4 The means values and the statistical data of reproductive parameters variability to the Grey Steppe Bred from SCDCB Dancu

Specification	VP	Nr. IA	Calving-la interval	DG	SP	CI
I lactation	n	38	38	38	38	38
	\bar{X}	1006.31	1.26	-	275.71	-
	$\pm s \bar{x}$	46.4	0.1	-	1.36	-
	s	286.06	0.64	-	8.4	-
	V%	28.42	51.02	-	3.04	-
	Min	618	1	-	247	-
	Max	1736	4	-	289	-
II lactation	n	24	24	24	24	24
	\bar{X}	-	1.28	200.5	278.95	240.54
	$\pm s \bar{x}$	-	0.13	33.83	2.12	48.72
	s	-	0.71	165.77	10.4	238.69
	V%	-	55.43	82.68	3.72	99.23
	Min	-	1	32	245	32
	Max	-	4	533	295	990
III lactation	n	16	16	16	16	16
	\bar{X}	-	1.5	198.68	276.43	257.37
	$\pm s \bar{x}$	-	0.15	65.59	3.02	63.57
	s	-	0.63	262.36	12.08	254.29
	V%	-	42.16	132.04	4.37	98.8
	Min	-	1	37	252	37
	Max	-	3	1103	289	1103

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